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ABSTRACT

This document has been published by an ad-hoc committee with the purpose of guiding the development of industrial arts activities as an element of career education. The relationship of industrial arts education to career education and the scope and sequence of industrial arts activities within this relationship are discussed. The integration of life related experiences, professional development, student organizations, support systems, and program assessment are also emphasized. Brief suggestions are made for the organization and administration of career education programs and a format for curriculum development and program implementation is presented. (JC)

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INDUSTRIAL ARTS

career education

Project Headquarters:

University of Pittsburgh
School of Education
Department of Vocational Education

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GUIDELINES FOR INDUSTRIAL ARTS IN CAREER EDUCATION:

Implications for Curriculum Development and Program Implementation

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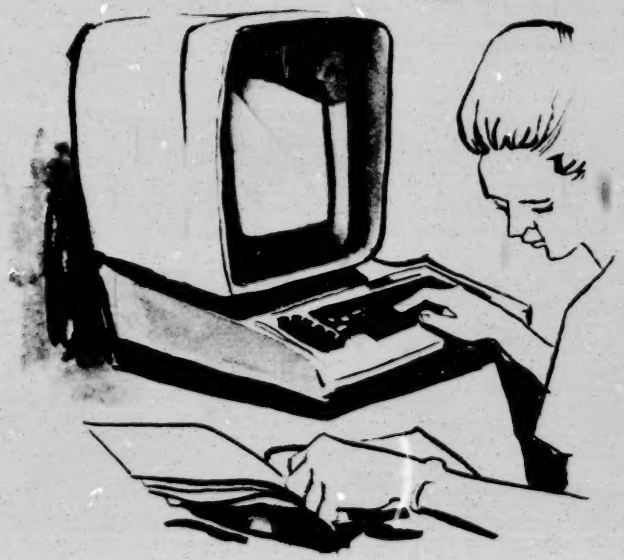

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FOREWORD

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November, 1973 publication of the *Federal Register*. Industrial arts programs meeting these criteria are eligible for federal vocational funds.

The new legislation assists, too, in establishing a basis for the educational relationship between and among industrial arts, vocational education, and career education. That part of vocational education with which industrial arts education is associated includes trade and industrial and industrial technical education. In achieving career goa's, within the career education concept, industrial arts provides career awareness and exploration, while trade and industrial education prepares for entry into recognized occupations. Logically, then, industrial arts education supports both trade and industrial education and industrial technical education through instruction designed to (1) assist individuals in the making of informed and meaningful occupational choices in industry and technology and (2) prepare individuals for enrollment in advanced or highly skilled vocational and technical programs.

Prior to the passage of this legislation and the awarding of a grant for this project, the United States Office of Education assembled an ad hoc committee composed of members of the two national professional organizations that represent industrial arts personnel. This committee, known as the Ad Hoc Committee on Criteria and Guidelines for Funding Industrial Arts, developed and disseminated a position paper to the profession for its reaction. Widespread support and approval of this paper was given by educators and members of local, state, and national associations in their responses to the United States Office of Education.

In recognition of the need for additional professional planning for programs to serve youth and adults, a proposal was approved by the Office of Education to further the work of the ad hoc committee to develop "Guidelines for Industrial Arts in Career Education: Implications for Curriculum Development." This document is the result of the combined effort of members of a selected task force and participants in two national reviews and two national open hearings. Constant review and updating of these guidelines will assure their continued relevance.

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A special thanks is extended to Dr. Robert M. Worthington, formerly Associate Commissioner of the Bureau of Adult, Vocational and Technical Education, who conceived the idea of the guidelines. Without his foresight and continuous support the implementation and goals of this project could not have been accomplished. Special thanks are also extended to Dr. Elizabeth Simpson, Director of the Curriculum Center for Vocational and Adult Education, and to Mr. William Dennis, Program Specialist of the United States Office of Education. They gave untiringly of their time and their ideas. Finally, the attractive art work is credited to Mrs. Mary [illegible], New York School System and Mr. Joseph Metcalf, of Illinois [illegible] these efforts are indeed noteworthy.

[illegible] in developing "Guidelines for Industrial Arts in Career [illegible] input from a wide variety of resources. General curriculum con- [illegible] arts curriculum consultants, industrial arts professional [illegible]ational and state levels, industrial personnel, as well as industrial [illegible] general were among them. Many professionals gave unselfishly [illegible]ting the Task Force in the development of the Guidelines. All ef- [illegible]Task Force are indeed appreciated. It would be impractical to [illegible]c contributions which all individuals made. Hopefully, it will suf- [illegible]ls who performed special tasks for the Task Force as indicated by [illegible]r which their names appear.

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INTRODUCTION

Industrial arts is a unique element of the United States educational system. The major ern of industrial arts is the interaction of man, society, and technology. Recent ments in space technology, medicine, farm and factory productivity, housing, tion systems, shopping centers, and recreation facilities are but a few this nation's technological advancement. Early analysis of the social oduced by science and technology resulted in some feeling of optimism. as impressed by the new inventions, machines and processes, and their s to citizens through higher standards of living. It was thought that technological nces induced automatic progress and improvement; consequently, the task of ucation was to impress these achievements upon the minds of the young.

The positive effects of technology notwithstanding, there are negative aspects that must also be considered. Misguided technology has contributed to the deterioration of our environment. In the name of efficiency, work roles have often become tedious, man has lost individuality as a result of a high degree of specialization and the unemployment rate fluctuates uncertainly. At the same time, education has failed to provide students with both an understanding of industry and technology and an understanding of the positive and negative consequences which industry and technology can cause.

Furthermore, in too many instances, schools assume that social and cultural differences among students can be homogenized and that social values and aspirations can be developed through a program of common educational experiences. But contrary to expectations, these assumptions have not been borne out by fact. Instead, it has been discovered through experience that this process has led to the reinforcement of the status and privileges of a particular segment of the community. Thus, while the schools have served some individuals well, they have failed to serve many who have the greatest needs and the severest deprivations. This situation has led to a high rate of student withdrawal from the educational system and to graduates ill prepared for productive roles.

In order to make a maximum contribution to the total educational process, industrial arts educators throughout the nation are seeking ways of establishing the role of industrial arts in career education. This publication, "Guidelines for Industrial Arts in Career Education: Implications for Curriculum Development and Program Implementation," has been developed to assist school personnel, members of boards of education, advisory committees, and lay groups in planning appropriate programs for implementing industrial arts as an important element of career education.

The Task Force intends this publication to be a guide as the title implies. It is not a prescription for program development. The material reports the views of the professions as interpreted by the Task Force.

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WHAT IS CAREER EDUCATION?

"Career education provides for a broad approach to preparation for citizenship; provides job information and skill development; and also helps individuals develop attitudes about the personal, psychological, social and economic significance of work in our society. It develops and fosters vocational and recreational interests of individuals to help prepare for a well-rounded living in a world in which leisure time is increasing and greater opportunity for a self-expression through creative production is available."

Sidney P. Marland, Jr., former U.S. Commissioner of Education, now Assistant Secretary of Education.

Career education enhances the goals and purposes of education as a whole. It provides a basis for unifying the community and all aspects of education as equal partners in the educational process. All subject fields have a responsibility to assist each individual in becoming a fully capacitated, self-motivated, self-fulfilled, contributing member of society. The following definitions encompass the essential concepts which are the criteria for determining the various competencies and performance objectives of career education:

1. **Fully Capacitated** means that the student, assisted by school personnel, shall perform his life roles with the skill, knowledge, and understanding necessary for acquiring the competence to be successful. A person's life consists of the various roles he performs. The emphasis placed on each aspect will vary according to the lifestyle. Career education will assist each student to:
   a. Contribute to the economic life of society by being a renderer of services or a producer and/or consumer of goods.
   b. Assume responsibility and participate as a member of a family group.
   c. Be a successful participant in the life of the community.
   d. Develop capacities for participating in avocational activities.
   e. Accept responsibility for the aesthetic, ethical, and moral life of the community.
2. **Self-motivating** means that the individual has acquired the inner strength and drive to perform his career roles effectively.
3. **Self-fulfilled** means that one has gained the ability to secure satisfaction and personal meaning from his life work and activities.
4. **Contributing** means that what an individual does in his multiple life roles becomes a constructive force for the maintenance and improvement of the culture of which he is a part.

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Learning experiences have a cumulative impact upon students' effective performance in their social roles. To provide for this accumulation, the learning sequence has the following career-related elements which will enable each student to:

1. Discover the variety of existing career possibilities and the steps involved in achieving them.
2. Select or reject career alternatives based on experiences.
3. Refine tentative career choices through further discrimination among alternatives.
4. Develop knowledge and skill for occupational entry participation.
5. Derive direct experience through occupational-oriented activities.
6. Have the freedom and competence to rechoose among career alternatives.

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WHAT IS INDUSTRIAL ARTS EDUCATION?

Definition

Industrial arts education is that field which provides opportunities for all students from elementary through higher education to develop an understanding about the technical, consumer, occupational, recreational, organizational, managerial, social, historical, and cultural aspects of industry and technology. Furthermore, it is a field wherein students acquire industrial-technical knowledge and competencies through creative and problem-solving learning experiences involving such activities as experimenting, planning, designing, constructing, evaluating, and using tools, machines, materials, and processes.

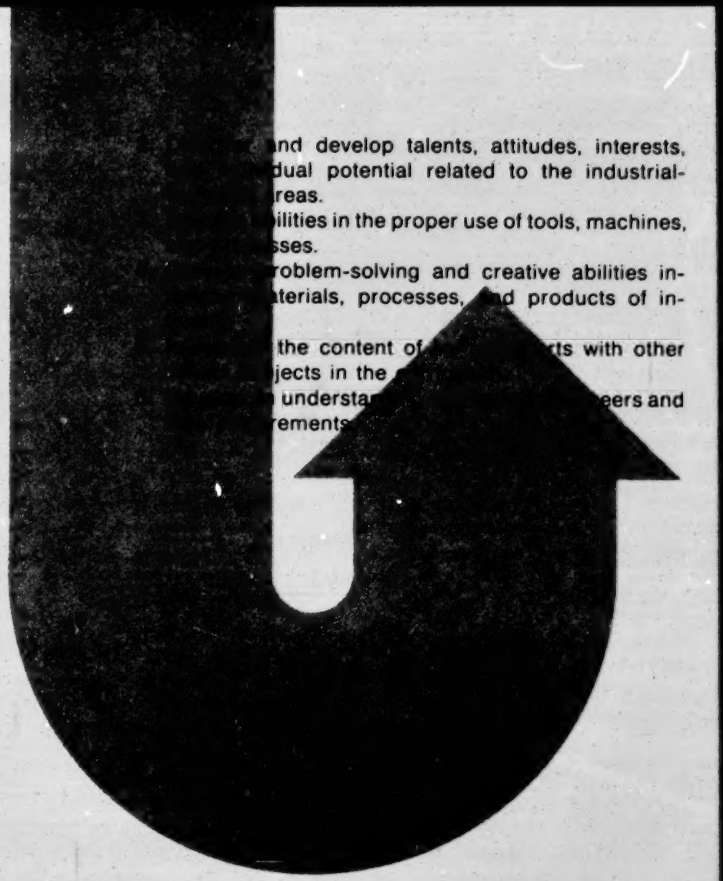
Purpose

Industrial arts provides unique experiences that further the discovery and development of each student's career potential, technical abilities, judgment, self-reliance, and resourcefulness to succeed as an effective producer and/or consumer in the industrial-technical society.

Goals

To provide a sound program of industrial arts, clear and realistic goals are essential. These goals provide opportunities whereby each student will:

1. Develop insights and understandings of industry and its place in our culture.



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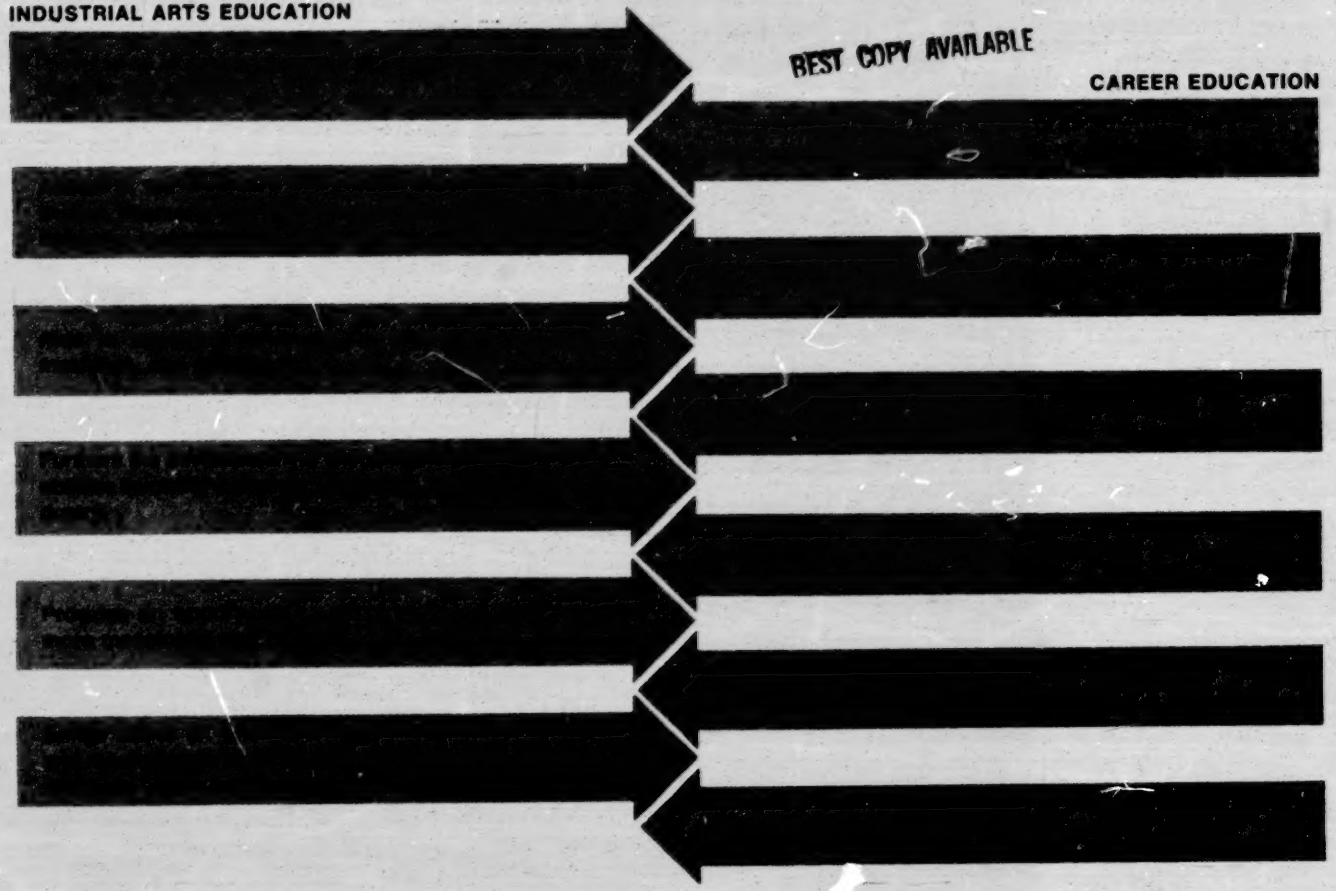
RELATIONSHIP OF INDUSTRIAL ARTS EDUCATION TO CAREER EDUCATION



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Industrial arts offers opportunities for students to engage in learning activities relevant to their future roles as members of an industrial-technical society. The contribution of industrial arts to youth through the career education concept can be seen more clearly when the goals are compared.

Industrial arts programs focus on a broad spectrum of studies in industrial technologies which include: (1) career fields (such as transportation, manufacturing, construction, communications); (2) materials (such as woods, metals, plastics, ceramics); and (3) processes (such as planning, designing, constructing, organizing, controlling, producing, operating, servicing). These experiences and other activities provide an individual with opportunities to discover and develop aptitudes, interests, and such personal qualities as self-reliance, sound judgment, resourcefulness and flexibility.

Success in careers requires, among other things, adaptability to technological change. Industrial arts programs provide for the development of a broad range of competencies in the technologies as a base for career adaptability. These competencies, along with technical and problem-solving abilities, are essential to future careers in an industrial-technological society. The contribution of industrial arts to the goals and purposes of career education, therefore, is necessary in an educational system concerned with the career development process. In addition, the following characteristics are inherent in a comprehensive career education program. The program will:

1. Increase the relevance of all educational subject matter and promote a restructuring and focusing of it around a career development theme.
2. Provide students with the guidance, counseling, and instruction needed to develop self-awareness, self-direction, and expanded career awareness and aspirations.
3. Assure students that prior to leaving school, they will have the opportunity to gain an employment skill and/or the knowledge necessary to pursue further education.
4. Utilize and coordinate community resources, whenever possible, for the student's attainment of career goals.
5. Provide educational and career options to all persons through flexibility which facilitates entrance or reentry into either the world of work or the educational system, as appropriate.
6. Provide services for placing every person in the next step of his career development.

Properly maintained industrial arts programs contribute to each of the foregoing comprehensive career education program characteristics listed above. A careful review of the "Student-Centered Goals of Industrial Arts and Career Education" will serve to make this point clear.

SCOPE AND SEQUENCE

Industrial arts learning experiences related to career education are sequential, beginning in the early grades of the elementary school and continuing through higher education. In addition to sequence, the instructional content at the various levels or phases must be comprehensive enough to represent the major categories of the industrial-technical enterprise.

The continuum of industrial arts courses is valuable for the following reasons:

1. The content provides students with occupational and related socioeconomic information.
2. Instructional emphasis is placed on active laboratory and classroom experience.
3. Experiences are available to all students at all levels.
4. Students have the opportunity to change courses within the continuum whenever individual interests or abilities, or the lack of them, are identified.
5. Provision is made for students to be scheduled into courses for variable periods of time as individual needs make this advisable.
6. The sequence and content of the courses are educationally sound with regard to human development psychology, the organization of career information, and learning theory.

The following chart encompasses the sequential levels or phases in the range of industrial arts educational activities from kindergarten through higher education.

No reference is made to specific grade levels or course titles because school systems utilize a wide variety of organizational patterns and instructional content based on local situations:

ELEMENTARY GRADES	**Self and Career Awareness**—Programs designed to familiarize students with the many kinds of work people do and the interrelationship of such work in the production and use of goods and services. In addition, students develop self-awareness in relation to various industrial-technical occupations. Industrial arts experiences infused in the total elementary instructional program emphasize positive attitudes toward work and the relationship of manipulative activities.

MIDDLE GRADES	**Career Orientation and Exploration**—Programs consisting of laboratory instruction to give students experience with the kinds and levels of activities performed by persons in a broad range of industrial pursuits and all levels of occupations for which special skills are required; to inform them of prerequisites for careers; to acquaint them with the significance of changing and evolving technologies; to instill in them an understanding and appreciation of work; and to assist them individually in making informed and meaningful career selections.
INTERMEDIATE GRADES	**Career Exploration**—Programs designed to provide transitional experiences that bridge the gap between the awareness/orientation focus and specialized in-depth offerings. Experiences provide students with opportunities to select and explore individual occupations and technical concepts, thereby assessing their own performance, aptitudes, and interests.

UPPER GRADES	**Career Development and Beginning Specialization**—Programs designed to prepare individuals for enrollment in vocational and technical education or institutions of higher education. Provision is made for experiences which might assist students in continuing to assess their interests, abilities, limitations, and potentials in respect to industrial-technical occupations, and provide them with competencies that contribute to occupational success. Instruction will also be provided for those who do not specialize in a technical area at this level and who wish to acquire broad skills and knowledge for personal and avocational reasons.
POST SECONDARY GRADES	**Adult, Continuing and Higher Education**—Awareness and exploratory programs of laboratory experiences designed for adults and out-of-school youth who may benefit from broad basic instruction related to industrial and technical occupations to obtain a better understanding of the industrial world and the profitable use of recreational and leisure time. Programs also provide for the preparation of professionals required to develop and maintain the efforts cited above.

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LIFE RELATED EXPERIENCES

At every level of education there is growing awareness that many experiences which take place outside the school lead to the accomplishment of desired educational outcomes. Learning activities in many school subjects require students to avail themselves of varied community resources that enrich and expand the outcomes which might otherwise be expected in formal school settings. In other situations, out-of-school experiences form the basis for the total school curriculum.

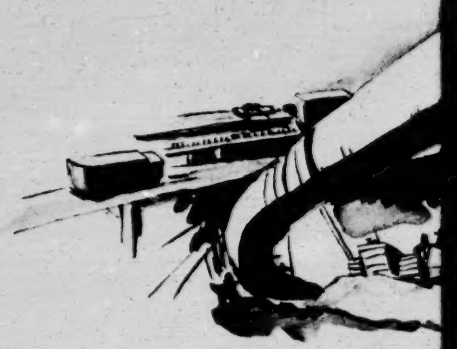
In an attempt to enrich or augment learning that takes place in the school, other settings are used: museums and natural settings for art students, concert halls for music students, archaeological sites and natural cultural settings for anthropology students, marketplaces for distributive education students, health centers and hospitals for science students, and others. All of these examples are considered life-related learning experiences which utilize community resources that contribute to the achievement of stated objectives. The out-of-school experiences may be classified as general education or vocational education, depending on the objectives.

Colleges and universities are beginning to grant credit for all types of life-related experiences cosistent with their objectives. The wide-spread use of the *General Education Development* testing program as a measure of high school equivalency is well known and gives further evidence of the value of life-related experiences as they relate to learning.

Industrial arts programs are urged to provide life-related experiences through the utilization of appropriate community resources. These experiences should be directly related to the fulfillment of the industrial arts goals, as cited on page 6 and 7.

Opportunities in industrial arts which permit students to experience employment as a means of exploration will provide insights into the world of work. Such learning experiences unite the community and the school in a program that assists students in the further development of positive attitudes toward work and school and aids them in assessing career goals.

All out-of-school experiences require supervision and evaluation by qualified school personnel to insure that on-site assignments and the environment are adequately serving the students' educational goals.



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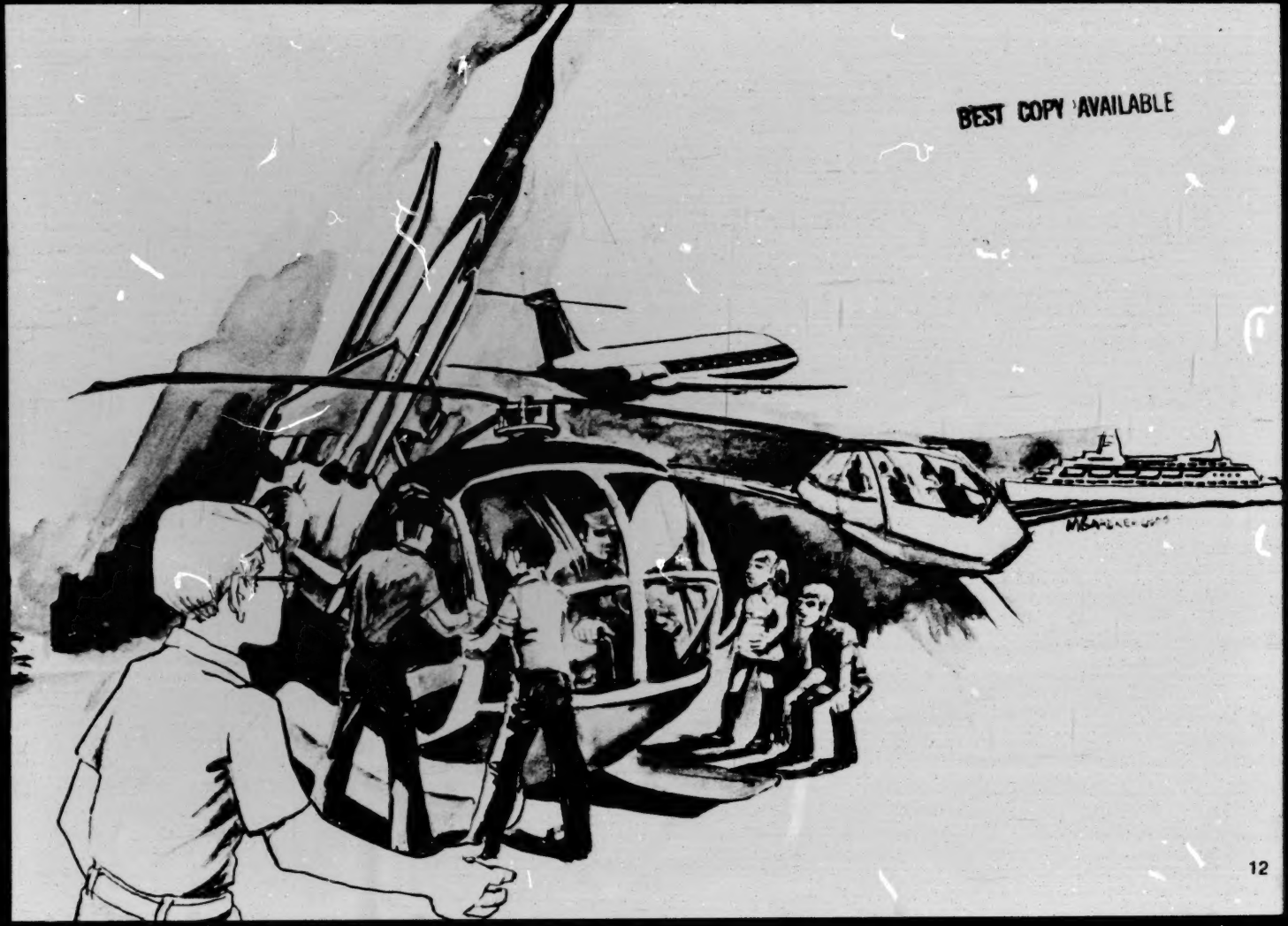

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PROFESSIONAL DEVELOPMENT

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Pre-service and in-service pre... complished by conferences, sh... courses, workshops, and intere... ducted by local school system... local or state supervisors, profes... industrial or business agencies.

The professional developm... educators takes place through ... tional media, performance activi... propriate to industrial arts and ca... for analyzing and observing care... programs in industrial arts that m... tion concepts.

Pre-service and in-service edu... cooperative education opportuni... vised work experience as a mean... petence of the teacher to teach... aspects of industrial arts. In ad...

provides a means of developing guidance personnel, curriculum specialists, supervisors, and administrators who can support industrial arts programs and activities within the conceptual framework of car... education. In... local, state, ...ort to pre-

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STUDENT ORGANIZATIONS

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Because this type of group-[illegible] in the usually more formal atm[illegible] group interaction and social skills be[illegible] naturally to student organizations and [illegible]

Industrial arts clubs should be an inte[illegible]al part of the student's total education. As essential elements in the educational experience, such programs fall under the supervision of industrial arts personnel. Club activities can provide:

1. Leadership development.
2. Improved social skills and school grades.
3. Opportunities to express ideas for group analysis.
4. Skills in the democratic process.
5. Impetus for building responsibility and dependability.
6. Feeling of esprit de corps.
7. Organization for group action.
8. Opportunities to meet community leaders.
9. Information on careers outside the school's curricular offerings.

10. Enrichment activities, for school subjects, (such as field trips). Active leadership in the club program provides an excellent training ground for future industrial arts educators.
Industrial arts students are given the opportunity to participate in student organizations at both the secondary and college level under the sponsorship of one of the professional organizations. The expansion of this existing program to include the concepts of career education could form the basis of the youth organization program in this area.

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SUPPORT SYSTEMS

The following support systems and functions are essential if the career emphasis in industrial arts instruction is to be efficient, valid, and timely. The activity-oriented programs are related to industry, industrial production techniques, and the roles people play in the world of work. Therefore, the school program should not be organized in isolation, but rather with the supportive assistance of facilities, materials, and human resources.

1. **Facilities**

The activity-based learning experiences which dominate secondary industrial arts programs require a laboratory environment. Such laboratories need sufficient space for instructional experiences—ideally, a work or study station for each student enrolled. Auxiliary spaces, for the purpose of storing, finishing, material-testing, student planning, housing instructional references, teacher planning, and other specialized activities, make instruction more efficient. In order to fulfill the course objectives, activity-based learning also requires adequate equipment, tools, and furniture. The laboratories and instructional content are justified by, and correlated to, the program level and the student's maturity level. Standards for facility planning are readily available in educational literature and from state departments of education; however, flexibility is required in laboratory design. Federal, state, and local facility regulations set the requirements for safety and construction, but the content of the instructional program should dictate physical layout patterns. Creative and functional design is imperative.

2. **Materials**

Instructional materials support course content. A vast array of instructional materials related to industrial processes, skills, and information are available. Program development to implement career education requires additional materials to complement those previously used. Many suitable career information materials are produced by industry, business, government, and education. In addition, however, career information materials suited to a given course may require special attention and development. Instructional materials should be selected to provide individualized instruction through use of a wide variety of hardware and media.

Consumable materials and supplies are vital to support instruction. The hands-on learning activities for career orientation and exploration place a heavy demand on consumable materials. Special consideration of the procurement and budgeting for such supplies is advised in view of the activities involved in the new approach to content organization. Sufficient consumable materials to support the demands of instructional content are essential to the fulfillment of program objectives.

3. **Community Resources**

Most communities are rich in resources which can and must be employed in career education if that education is

to be relevant to contemporary society. Industrial arts programs should utilize the industrial, technological, and human resources available for both program planning and instructional enrichment.

4. **Advisory Committees**

Advisory committees at state and local levels should help the educators to determine the nature of the programs to be offered, the content and activities of each course, and the facilities required to implement the program. These committees are helpful in interpreting citizen needs and in identifying the human and material resources available from the community and industry. They are not policy- and decision-making groups. Their advice is valuable, however, and should be followed to the greatest possible extent. Industrial arts advisory committees at the local levels should establish liaisons with state advisory committees to provide input and counsel related to the concerns of industrial arts.

Advisory committees should be staffed with pesons who represent competence in their respective fields of endeavor. Production control managers, foremen, small shop owners, and directors of state employment services are examples of those most helpful. Members of such committees should reflect all aspects of activity associated with the study of industry. Representatives from the community, education, and relevant institutions and agencies should also be included. When indicated, students also should be included as members.

5. **Research**

Both basic and applied research activities are important in industrial arts programs. Technology, occupations, work requirements, societal influences on people, and other factors which affect industrial arts education are rapidly changing, and the pace of that change is explosive. Systematically-designed research activities, including action research, must be continuously employed for the improvement and validation of industrial arts programs.

6. **Guidance and Counseling Services**

Guidance and counseling services are essential components of career education. The effectiveness of the services is measured by a student's ability to make career decisions based on a realistic assessment of personal values and interests, social trends, occupational outlook, and scholastic performance. Quality guidance and counseling consists of individual assessment and advice during the various and complex stages of the career decision-making process. Among other objectives, guidance must emphasize the following.

1. Preparing students in the skill of decision-making (such as the utilization of what he has learned about himself, his interests, values, capabilities, and the world of work).
2. Sensitizing students to their responsibility for creating satisfying adult roles which are adaptive and responsive to their social milieu.

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Industrial arts, by systematically developing and including appropriate career information related to laboratory experiences, is rich in opportunities for contributing to the guidance process. Industrial arts programs, by assisting in the identification of individual interests, performance, and capabilities, should be considered an integral part of all students' career development process.

Formal and cooperative relationships between guidance counselors and industrial arts educators are necessary. Their mutual concern for programs and students can be the tie that binds them in an interactional process. In the capacity of consultant, the guidance counselor can work with the industrial arts teacher in the area of self- and career-awareness, showing the latter simple and basic techniques and sharpening his observational skills so that he can facilitate group processes and individual conferences.

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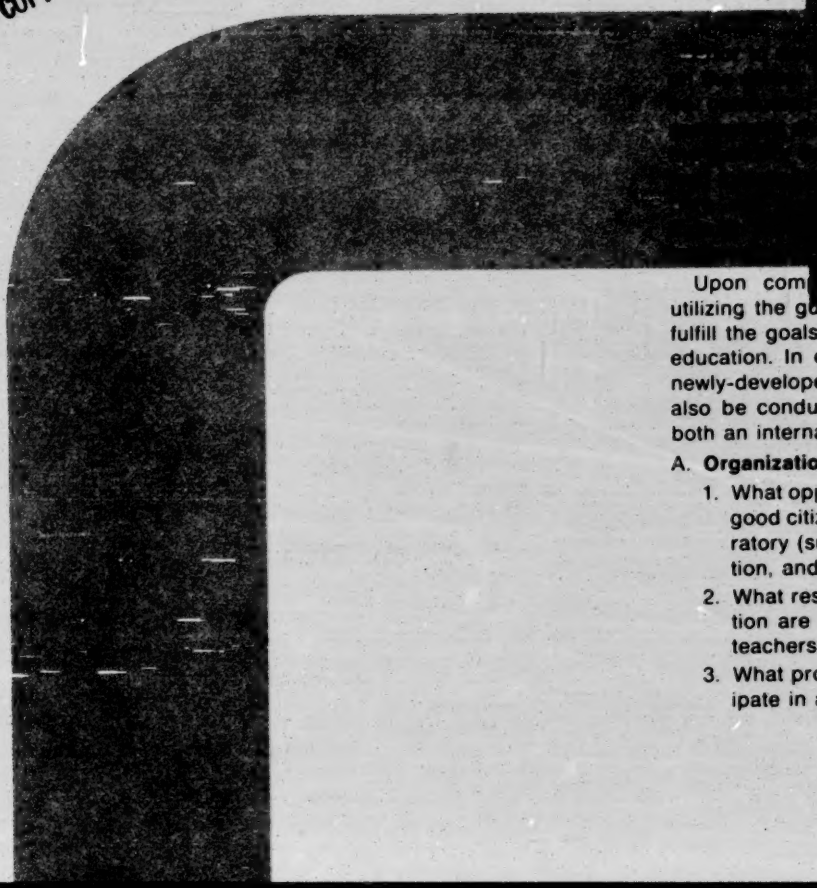
PROGRAM ASSESSMENT



a program of industrial arts based concept, an assessment should es appropriate criteria. This basis for program improve- internal assessment should ssentially answer the question ntribution to career education am offerings and, if not, where are ed?"

Upon com tion of the internal assessment, and utilizing the guidelines, a program should be devised to fulfill the goals of industrial arts as they relate to career education. In order to evaluate the effectiveness of the newly-developed program, an external evaluation should also be conducted. The following questions provide for both an internal assessment and an external evaluation.

A. **Organization**

1. What opportunities are afforded students to practice good citizenship principles in the classroom or laboratory (such as responsibility, leadership, cooperation, and positive attitudes)?
2. What resource materials pertinent to career education are readily available to and regularly used by teachers and students?
3. What provisions exist whereby students can participate in activities related to a variety of careers?

4. What evidence exists to show that each laboratory contains adequate equipment to ensure a student's positive initial orientation to and exploration of career pursuits?
5. What evidence is available to show that vocational, avocational, and recreational interests are fostered and developed among students?
6. What evidence is available to show that individuals are making meaningful career decisions based upon accessible occupations and educational options?
7. What evidence is available to demonstrate that students have the opportunity to make a realistic assessment of their personal abilities, interests, and goals as they relate to career pursuits?
8. What programs and options are available for students to pursue specific career interests?
9. What evidence is available to demonstrate that subject matter utilizing the career education approach is meaningful and relevant to the student?
10. What evidence is available to show that counseling personnel have assisted in the process of developing self-awareness, strengthening self-direction, and increasing career awareness?
11. What procedures are used to place students in the next step of their career development?
12. What procedures are employed to make use of the community's human and physical resources in carrying out the goals of the program?
13. What flexibility has been provided for entry or reentry into existing educational programs?
14. What kinds of multisensory approaches are regularly employed in instruction?
15. What evidence is available to substantiate the use of an advisory committee?
16. What operation and activities are associated with the youth organization connected with the program?

B. **Program**

1. What examples illustrate that the goals and objectives of the total program are identified and are consistent with those of career education?
2. What instructional management plan is used to implement and evaluate the program?
3. What specific program objectives are written in performance terms?
4. What student activities reflect a multisensory and hands-on approach to individualized learning?
5. What assessment and reporting procedures are used to evaluate the student's utilization of performance objectives?
6. What process is used whereby staff, administration, students, and the community are involved in program development, implementation, and evaluation.
7. What evidence and data have been used in identifying programs formulated to meet the needs of the students and community?

8. What relationship exists between a given program, the total school curriculum, adult education, higher education, and other related educational support systems?

C. **Resources**
1. What evidence shows how advisory committees are used in the development, implementation, and evaluation of the program?
2. What resource materials are used to implement the program?
3. What community resources are utilized in the implementation of the program?
4. What administrative and financial support does the program receive?

D. **Facilities/Equipment**
1. What procedures are used to identify facility and equipment requirements?
2. What existing facilities meet program requirements?
3. What plans have been made to modify and more completely equip existing facilities to meet program requirements?

E. **Staff Improvement**
1. What provisions have been made by institutions to prepare teachers who understand how to implement and refine the program?
2. What contributions have training institutions of higher education made to local program development?
3. What in-service training needs have been identified and what procedures have been established for developing and implementing programs?
4. What activities is the staff engaged in for professional improvement?

F. **Follow-up**
1. What current procedures are used to follow up students who have completed specific programs and are enrolled in a vocational or technical program; enrolled in a higher education program; or employed in the labor market?
2. What is the responsibility of the placement service in following up graduates?
3. What specific provisions are used to correct deficiencies identified in the follow-up survey?

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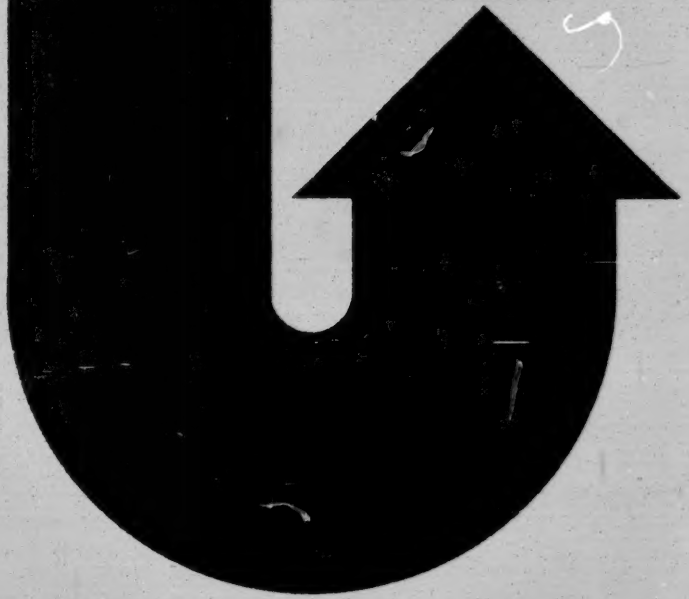
ORGANIZATION AND ADMINISTRATION

The State Board of Education is the agency responsible for adopting rules and regulations concerning programs supporting career education and those funds which may become available through state and federal legislation. Depending upon the organization of the state educational system, the policies regarding the administration of vocational education are established and the state plan is adopted by either the State Board of Education or the State Board of Vocational Education. The state plan must include requirements that, in turn, must be met by industrial arts courses and/or programs in order to be eligible to receive funds under the Vocational Education Act and its amendments.

The State Department of Education is designated as the staff of the State Board(s) and is administered by the Chief State School Officer. State industrial arts staff members whose financial support is from federal and/or state funds devote attention to activities which contribute to the development, coordination, and administration of industrial arts as it complements and enriches the state's career education program. The staff of each state education agency needs one (or more) designated supervisor(s) of industrial arts. The changing role of industrial arts, the large number of teachers employed in local districts, and the special requirements of facility, equipment, and

t up the urgency of this need. Such per-
ve appropriate certification and teaching

teachers are appropriately certificated,
ve their preparation at institutions ac-
are industrial arts teachers.



FORMAT FOR CURRICULUM DEVELOPMENT AND PROGRAM IMPLEMENTATION

The process of developing new programs and improving existing ones is a complex task. As a result, it is helpful to have guidelines to follow and to use in a variety of ways. For program development it is necessary to use a guide as a point of departure. For program improvement the guide might serve as a measure of assessment to identify omissions, lack of sufficient emphasis, or overemphasis in content or experience.

The following are criteria and a format to help curriculum designers develop and/or improve instructional programs of industrial arts as they contribute to career education. The criteria, by design, are broad in scope so that they might be widely applicable. Before attacking the task of program development or improvement, however, the practitioner may wish to clarify each criterion with a set of more specific objectives.

Rationale:

The rationale is a statement which considers both philosophical and psychological reasoning for industrial arts as a field of study in the total school program. This statement should reflect the needs of students, society, and the school. In addition, the statement should identify the contribution of industrial arts to student learning through career education. The rationale should be:

1. Consistent with the career education concept.
2. Consistent with the purposes of industrial arts.
3. Compatible with the school philosophy.
4. Compatible with the goals of vocational-technical educators.

Goals:

Program goals should be derived from the rationale and reflect a consensus of the established goals of industrial arts. Further specific objectives are later derived from an analysis of the broad goals, and are categorized into compatible groups or courses. Consideration must also be given to the established goals of career education. Care should be taken that the goals are not stated in unrealistic, and therefore meaningless terms. The goals should:

1. Reflect the extent of the rationale.
2. Be realistic.

Content:

Content is the teachable material derived from an identified source which enables the program objectives to be realized. These sources are essential to a complete industrial arts career education program. Content is derived from:

1. Human development and needs.
2. Industrial technologies, organization, processes, materials, careers, and problems.

The content from these sources must be categorized into courses and organized into a complete program of industrial arts. Such a program would provide students with an opportunity to explore a broad content base and progress to specific study. During the sequential phases prior to beginning specialization the content is validated against a conceptual framework, while in the beginning specialization phase it is validated by a task analysis. Content is:

1. Organized by scope and sequence.
2. Validated against a conceptual framework (sequential phases prior to beginning specialization), and
3. Validated against a task analysis (beginning specialization and beyond).

Curriculum development is a responsibility of local school districts and involves the teaching staff and curriculum specialists. Often, the process of curriculum development is as important an outcome for staff as the final guide and program design. The selection of the teachable content needs to reflect a balance of manipulative activities, knowledge units, and the development of attitudes and values. Content selection must also provide enrichment for gifted students and for remediation for students with learning difficulties. Content:

1. Is organized by group process.
2. Reflects the three domains of affective, cognitive, and psychomotor learning.
3. Provides for accommodation of varying learning abilities.

Population to be Served:

The population to be served by industrial arts through career education must be identified so that appropriate programs can be developed. Consideration must be given to:

1. Grade level.
2. Learning abilities.
3. Learning styles.
4. Needs, desires, and interests of students.
5. Special groups, such as handicapped and disadvantaged persons.

Instruction:

Instruction must be designed so that it enables students to experience the organized body of content. Properly designed, the process of education will rank concomitantly with content organization. Activities must reflect the impact of technology on society, industrial organization, production of goods and rendering of services, and a broad range of industrial occupations.

Instruction provides:

1. Activities which enable students to experience content.
2. Activities which reflect industrial technology, industrial organization, and a variety of careers.

A student's basic needs are dynamic. They are constantly changing not only for selected population samples, but for all members of society; therefore, a variety of teaching strategies must be employed to accommodate various learning styles. No single instructional method is

sufficient: the teacher must provide students with many avenues of learning. These opportunities may lead to learning beyond the school environment. Instruction should provide:

1. A variety of teaching methods and media.
2. Opportunity for varying learning styles.
3. Learning opportunities beyond the school environment (such as youth groups, field trips, cooperative education, work experience).

Facilities, Equipment and Materials:

The physical environment must provide an atmosphere that enables learners to experience the organized content. To do this, the facilities, equipment, and materials must be flexible in order that teachers may use a variety of methods. Changing technologies require that the physical environment be constantly updated. Facilities, equipment, and materials must:

1. Enable learners to experience the content.
2. Permit flexibility to accommodate a variety of instructional strategies.
3. Reflect industrial activities.

Staff Development:

A program of industrial arts in career education requires that provisions be made for pre-service and in-service teacher education. This requires the cooperation of local school districts, colleges and universities, state departments of education, and community resources. Professional and technical aspects of staff development provide for content updating, methods revision, media development, and technical competency improvement. Responsibilities for in-service education lie primarily with local school districts, whereas pre-service education is a prime responsibility of teacher-preparation institutions. Staff development programs provide:

1. Continuous updating of content, methods, media, and technical data.
2. The opportunity for community involvement.
3. An environment of cooperation with colleges and universities for both pre-service and in-service education.

Evaluation:

Evaluation is a continuous, essential element of an instructional program. By design, goals are stated when a program is initiated. Evaluation provides a measure of goal achievement. This assessment should be both internal and external. Internal evaluation provides a continuous measure for program improvement, whereas external evaluation provides a periodic measure of total program effectiveness. In both instances, the program's stated objectives are held accountable.

Within the scope of program evaluation, individual student objectives should be assessed as a measure of student growth and instructional effectiveness. Evaluation is:

1. An internal assessment of program effectiveness.
2. A periodic assessment by outside experts as a measure of long-range goal attainment.
3. A measure of student growth.
4. A measure of teaching effectiveness.